

history. Suffice it is to say that in carrying out this great work Sir Charles Bright showed himself a man of extraordinary energy and power, rapid in thinking and acting, and endowed with courage and perseverance under difficulties—qualities which enabled him to bring this never-to-be-forgotten undertaking to a successful issue. In recognition of these great services rendered by him to the country and to science, Charles Tilston Bright in the year 1858 received the honour of knighthood at the early age of 26 years.

Sir Charles Bright's subsequent career is closely connected with many great works of telegraph engineering in different parts of the world, which he carried out with the same thoroughness that uniformly distinguished him. It is almost superfluous to mention the numerous instruments and appliances he invented for the improvement of telegraphy, which are well known.

The works he accomplished bear evidence of his skilful handiwork, his intuitive knowledge, and unerring judgment, and as the great fabric of the modern telegraph system rises and spreads throughout the world, its foundations and superstructure bear evidence of the vital part played by him in their construction and formation.

Sir Charles Bright was a Fellow of several learned societies, and was a member of the Institution of Civil Engineers. In 1865 the council of that institution awarded him the Telford Gold Medal. In the same year he was returned to Parliament as member for Greenwich. In 1881 he was appointed one of the British Commissioners at the Paris International Exhibition, and received from the French Government the cross of the Legion of Honour. In 1886 he became President of the Society of Telegraph Engineers and Electricians.

In 1853 Sir Charles Bright married the daughter of the late Mr. John Taylor, of Kingston-upon-Hull, by whom he leaves issue. He was taken suddenly ill while on a visit to his brother, and died of heart disease May 3, 1888.* He was elected a Fellow of this Society 1860, December 14.

JOHN RAND CAPRON was born in London, February 19, 1829. He was educated at the Grammar School, Guildford, and on completing his studies was articled to his uncle, Mr. John Rand, a solicitor in extensive practice in that town. After being admitted a solicitor, in 1850, Mr. Capron entered into partnership with his uncle, and subsequently succeeded to the business. He was soon appointed Borough Coroner and Clerk of the Peace, which latter appointment he held up to the time of his death.

In the midst of his many business cares and public engagements, Mr. Capron found leisure to gratify his enthusiasm for the study of natural phenomena, and it is as a scientific man of some distinction that his name will be best remembered. When

* Collated by permission from the *Electrical Review*.

at school he had a severe attack of typhoid fever, and during his convalescence a compound microscope was lent to him. This opened out a new world of wonder and beauty, and was the means of firing his ambition to examine some of the fascinating mysteries of creation. He took a special interest in studying the Earth's surface, making considerable progress in geology, and forming a collection of fossils and minerals of great interest and variety. But later on he turned his attention to spectroscopy and meteorological phenomena, and became a devoted student of astronomy.

In 1877 Mr. Capron published an important work on "Photographed Spectra," in which he gave, in a very easy and convenient form for reference, 136 photographs of metallic, gaseous, and other spectra, accompanied by critical explanations. For obtaining the spectra of the metals he employed a direct-vision prism of an inch aperture, with collimator and camera, and with this spectroscope he obtained photographs of the spectra of some forty metals, extending from about *b* to H. For most of these metals two photographs were obtained—one taken with the induction spark, and the other with the electric arc from a battery of 40 pint Grove cells. For the spectra of gases, three different spectroscopes were employed, one of these having two simple quartz prisms of 60°, and the others each a direct-vision prism of large size. The value of this work was fully recognised at the time, as it brought together so many spectra simultaneously before the eye, thus giving a far greater insight into their physical characteristics than could so readily be obtained by a study of the individual spectra with the spectroscope one after the other.

In 1879 Mr. Capron published a popular treatise on "Auroræ and their Spectra." In this work he presented a very complete history of early and recent observations of auroral phenomena, in which he carefully records the general appearance and special characters of auroræ; their geographical distribution; colours, height, and noises attributed to them; phosphorescence, polarisation of their light, &c. The most valuable part of the work is that devoted to an investigation of the spectra of auroræ. The subject is very carefully and exhaustively discussed, and the author's long series of laboratory experiments to elucidate and explain some of the obscure phenomena of auroræ will always be of value in any consideration of the subject. Mr. Capron thus expressed the conclusion at which he arrived from his researches: "As the general result of spectrum work on the aurora up to the present time, we seem to have quite failed in finding any spectrum which, as to position, intensity, and general character of lines, well coincides with that of the aurora. Indeed we may say we do not find any spectrum so nearly allied to portions even of the aurora-spectrum as to lead us to conclude that we have discovered the true nature of one spectrum of the aurora, supposing it to comprise, as some consider, two or more."

In an interesting pamphlet published in 1882, Mr. Capron called particular attention to the subject of the "Rainband," and the importance of observing it as indicative of the presence or otherwise of an excess of moisture in the atmosphere. Among his other scientific papers may be mentioned one on the remarkable auroral beam of November 17, 1882, published in the *Philosophical Magazine*, and the following communications published in the *Monthly Notices*: "Report of Examination of Sun's Disk at Guildford, March 21, 22, 23, 1877, for Suspected Planet *Vulcan*"; "The Partial Eclipse of the Sun, December 31, 1880"; "The Lunar Eclipse, 1881, December 5"; "The *Andromeda* Meteors."

Mr. Capron was a man of the most beneficent and philanthropic character, and took much interest in all the social institutions of his neighbourhood. He subscribed to a large number of charities, and was ever ready, though in the most unostentatious manner, to afford aid and succour to those in poverty and distress.

He had been in failing health for some time past, but his illness took a more serious turn in October, and he passed away on November 12, 1888, at the age of 59 years.

Mr. Rand Capron was elected a Fellow of this Society 1877, March 9, and for five years, from 1883 to 1887, he was a member of the Council.

WILLIAM COTTERELL was one of those few men—whose number, however, may be greater than it seems—who combine the unremitting pursuit of science with the regular occupations of business. The love of physical science, and especially of astronomy, was inbred in him. He inherited it from his grandfather, who, though purely an amateur, made his own telescopes, and acquired instruction by means that would seem meagre in view of the facilities that are now within the reach of everyone. Mr. Cotterell's tastes were thus pronounced from his boyhood. As a youth he was accustomed to take observations of the heavens, which he recorded for himself, making his own star-maps, and diligently working out problems and calculations by methods of his own. Born at Walsall, in Staffordshire, on April 13, 1827, he spent his whole life there, except for a few years' residence in London as a young man. His life was singularly free from incident, except those unobserved incidents which the student is conscious of, and which he remembers as signs of progress or attainment. Though a good citizen, he took no part in public life, otherwise than as being an active member of the Midland Institute at Birmingham, and of the Dudley and Midland Geological and Scientific Society. In connection with those institutions, and more widely—indeed throughout the Midland counties—he was recognised as an authority on the two special subjects to which he had given most attention—namely, astronomy and geology, though his knowledge of the science of